Industrial Organization - V

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Next class

- Entry and exit
- Review of class material
- 2 minutes presentations on your case studies + feedback from your colleagues.

Rules for the 2 mins presentations

- Each group selects a presenter.
- The presenter introduces the case, and motivates the choice.
- The presenter briefly mentions the major points of interest.
- A quick discussion with the class follows.

Today's class

- Closing words on auctions
- Geographic competition: Hotelling model

Auctions

Different ways of determining the pricing.
Who sets the price:

- Firm: pricing
- Buyer: auctions
- Both: negotiations

Auctions

Among the best forms of price-discrimination by self selection.
The *bidders* want to maximize profits, similarly to the rule of $MR = MC$ for firms.

Most popular forms of auctions

- Ascending price auctions (English auction)
- Second price sealed bid
- First price sealed bid
- First price descending auction

First price private value auction

Participants write secretly in an envelope their bid. The highest bid wins and the buyer pays the price of their bid.

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Optimal strategy

In the first price sealed bid auction, the best bid is given by:

$$b(v) = \frac{(N-1)}{N} v$$

Descending price auctions

In terms of strategies, first price sealed bid auctions are equivalent to descending price auction.

Buyers bid less than their valuation.

Second price sealed bid auction

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Ascending price auctions

In terms of strategies, second price sealed bid auctions are equivalent to ascending price auction.

Buyers bid exactly an amount equal to their valuation.

Explanations to over-bidding

Explanation 1

Risk aversion: the tendency to prefer outcomes with low uncertainty to those with high uncertainty.

Explanation 2

Underestimation of winning probability: if you systematically think that the others have higher valuations, and so you underestimate your probability of winning.

Winner's curse

It occurs if a bidder does not realize that winning the auction implies that the others' valuations were low.

The winner's curse occur in common value options: the value of the good is objective, but buyers only have access to partial information about the good quality.

The key point is that winning the auction is bad news about the value of the item for the winner. It means that he or she was the most optimistic and, if bidders are correct in their estimations on average, that too much was paid.

Geographic differentiation

In 1929, Hotelling developed a model ahead of his time.

A location game

- Consumers are *uniformly* distributed on a segment (10km).
- **Two** sellers, each located at the end of the segment (**location is fixed**).
- Sellers simultaneously set prices as in Bertrand.

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- **Two** sellers, each located at the end of the segment (**location is fixed**).
- Sellers simultaneously set prices as in Bertrand.
- A consumer located at the point x must travel a distance x to reach the first seller.
- The same consumer travels a distance $(1 - x)$ to reach the second seller.
- There is a travel cost t.

The model

From the perspective of the consumer located at x:

Cost of buying

- From firm 1: $p_1' = p_1 + tx \rightarrow$ the actual price of the good plus transportation costs (that depend on the distance).
- From firm 2: $p_2' = p_2 + t(1 - x)$.

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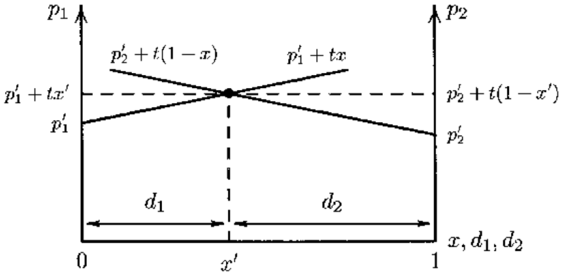

FIGURE 12.1 HOTELLING MODEL: TOTAL CONSUMER COST.

Demand curves

We consider different prices, and that all consumers buy.
What if Firm 1 sets a low price? What if Firm 1 increases the price?

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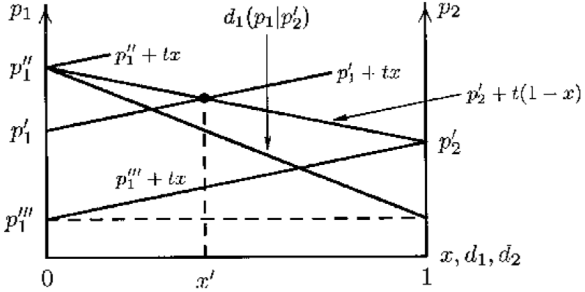

FIGURE 12.2 HOTELLING MODEL: FIRM 1'S DEMAND.

Equilibrium

Now we consider the equilibrium.

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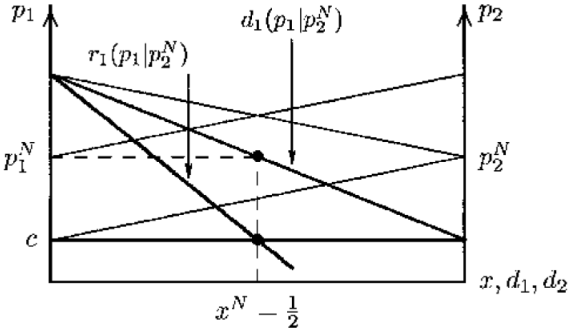

Figure 12.3 Hotelling Model: Equilibrium.

What did we learn?

We can interpret t as the degree of differentiation. Why?

Hotelling as product differentiation

Instead of space we measure distance in characteristics. The higher the transportation cost t implies that the consumers perceive as more costly to get a characteristic different from their preferred one.

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Product differentiation and market power

The greater the degree of product differentiation, the greater the market power $\Longrightarrow$ POSITIVE MARGINS.

Back to Bertrand

The Bertrand model requires the following assumptions:

- No capacity constraints
- One-shot interactions
- Homogeneous product

The Bertrand paradox

Even with two firms only, if the conditions above hold, firms make zero profits like in perfect competition.

Solving the paradox

It is clear that in reality firms operating in duopolies (and more generally in oligopolies) make positive profits.

The cases we studied

- ~~No capacity constraints~~

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- ~~No capacity constraints~~ $\Longrightarrow$ Cournot model (positive profits, each firm sells).
- ~~One-shot interactions~~ $\Longrightarrow$ Collusion (prices are higher than MR, price wars may occur).
- ~~Homogeneous product~~ $\Longrightarrow$ Hotelling with fixed “locations” (Firms share the market, prices depend on the degree of differentiation).

Endogenous locations

Now we imagine the situation where firms can change location.

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A profitable deviation

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Equilibrium with 2 firms

Both firms choose to be at the middle of the segment $[0, 1]$.

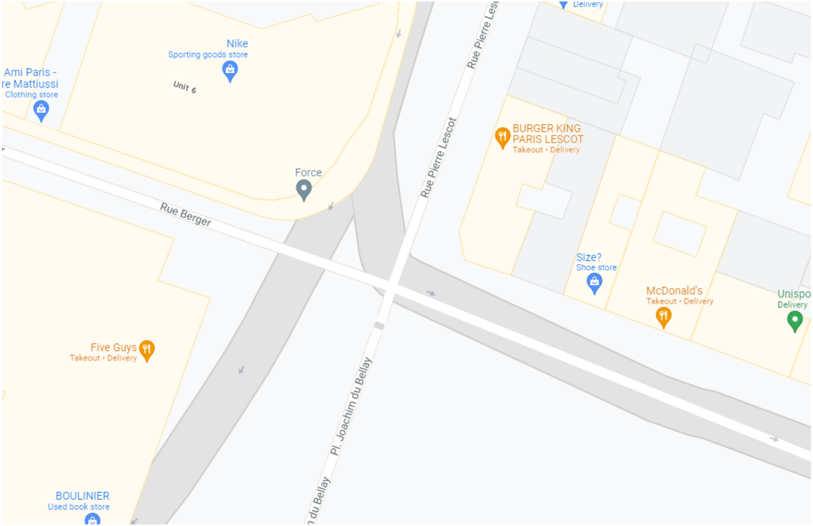
Equilibrium with n firms (n even)

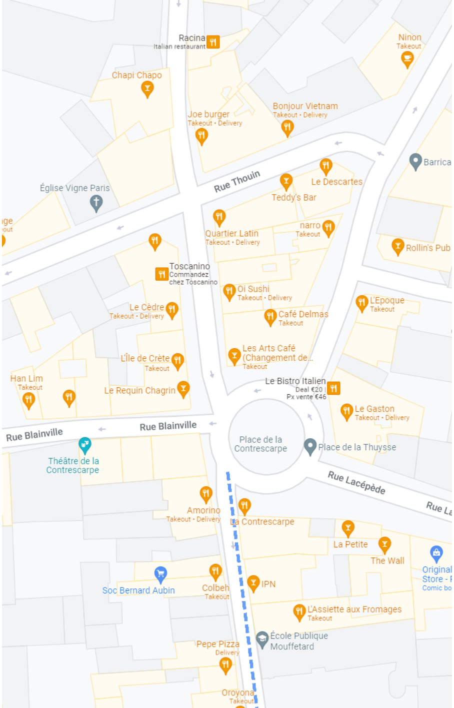
Exactly two firms will be at these points: $[1/n, 3/n, \ldots, (n-1)/n]$

Does it work?


BURGER KING
Rue Soufflot
McDonald's


URGENCE
URGENCE MÉDICALE
KFC Restaurant


Delivery
Nike
Sporting goods store
Unit 6
Ami Paris -
re Mattiussi
Clothing store
Rue Pierre Lescot
BURGER KING
PARIS LESCOT
Takeout · Delivery
Force
Rue Berger
Size?
Shoe store
McDonald's
Takeout · Delivery
Unispo
Delivery
Five Guys
Takeout · Delivery
Pl. Joachim du Bellay
BOULINIER
Used book store


Racina
Italian restaurant
Ninon
Takeout
Chapi Chapo
Bonjour Vietnam
Takeout • Delivery
Joe burger
Takeout • Delivery
Barrica
Rue Thouin
Le Descartes
Teddy's Bar
Église Vigne Paris
Quartier Latin
Takeout • Delivery
narro
Takeout
Rollin's Pub
Toscanino
Commandez
chez Toscanino
Oi Sushi
Takeout • Delivery
L'Epoque
Takeout
Le Cèdre
Takeout • Delivery
Café Delmas
Takeout
Les Arts Café
(Changement de...
Takeout
L'Île de Crète
Takeout
Han Lim
Takeout
Le Bistro Italien
Deal €20 |
Px vente €46
Le Requin Chagrin
Le Gaston
Takeout • Delivery
Rue Blainville
Rue Blainville
Place de la
Contrescarpe
Place de la Thuysse
Théâtre de la
Contrescarpe
Rue Lacépède
Amorino
Takeout • Delivery
La Contrescarpe
La Petite
The Wall
Soc Bernard Aubin
Colbeh
Takeout
IPN
L'Assiette aux Fromages
Takeout
École Publique
Mouffetard
Pepe Pizza
Delivery
Oroyona
Takeout

Proof of the result

Each position attracts $2/n$ customers, which are indifferent from buying from either firm.

We check if there are *profitable deviations*. If there are not, we are in an equilibrium.

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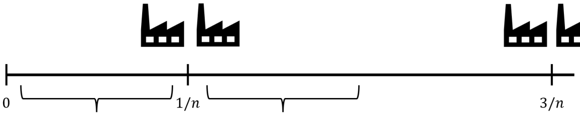

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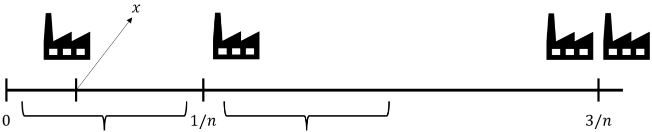
Case 1: going to other firms' location

It is easy to check that it is not profitable: It is easy to see that deviating, the firm now gets $2/3n < 1/n$.

Proof of the result

Case 2: going closer to the extremes



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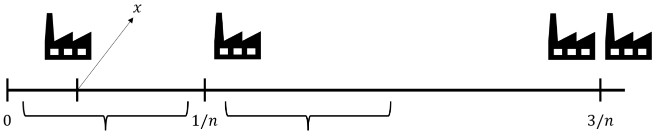

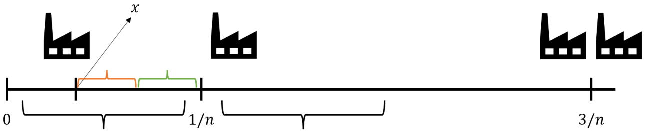

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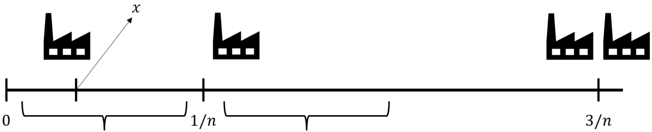

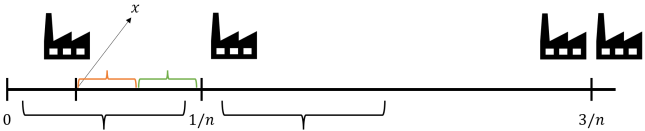

This deviation yields clearly less profits.

Proof of the result

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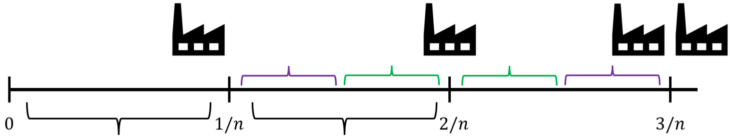

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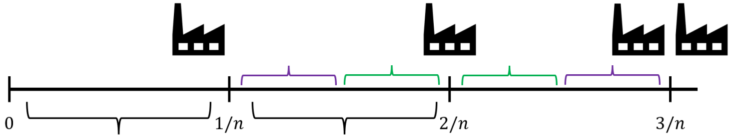

By deviating, the firm gets exactly $1/n$ customers, like the firm did in the original position. The profits are exactly the same, so it is not profitable.

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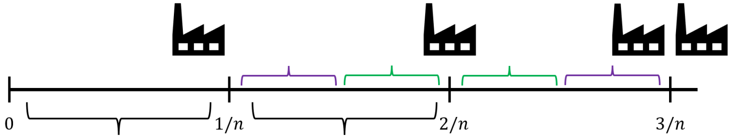

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Conclusion

We considered all possible deviations, none of which is profitable. Therefore the initial configuration is an equilibrium. □

Merci pour votre attention